



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,803	10/01/2001	Kazuhiro Tanaka	401384	3457
23548	7590	11/06/2003	EXAMINER	
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			CULBERT, ROBERTS P	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/965,803	<b>Applicant(s)</b> TANAKA, KAZUHIRO	
	<b>Examiner</b> Roberts Culbert	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 4-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                     | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                            | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>1001</u> . | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Claims 1-3 is acknowledged. Claims 4-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "target polishing speed" it is not clear if this term refers to the set polishing speed or the measured polishing speed as described in the specification.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,791,970 to Yueh.**

Referring to Figure 2, Yueh teaches a method of chemical mechanical polishing (CMP) comprising: supplying a slurry, and polishing an object with particles contained in the slurry, including controlling a physical quantity (Col. 3, Lines 8-9) which is a determinant factor of a polishing speed with respect to the object, based on information on the particles contained in the slurry.

Art Unit: 1763

Yueh also teaches a step of controlling polishing time based on information on the particles contained in the slurry using an end point monitor and control system (40).

**Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent 5,791,970 to Yueh or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent 5,791,970 to Yueh in view of U.S. Patent 5,531,861 to Yu.**

Yueh inherently teaches setting a target polishing speed according the type or quality of the surface film of the object to be polished, since the controller must use a set point as a reference for automatic process control.

Furthermore, the physical quantity is controlled such that the target polishing speed becomes constant. Note that adjusting the particulate matter in the slurry controls the polishing speed. The constant target polishing speed may be inferred from Col. 3, Lines 17-22 of Yueh. When the removal rate is high (i.e. above the set point) then the controller reduces the amount of particulate matter in the returning recycle (thereby reducing the removal rate). As one of ordinary skill in the art of process control recognizes, the described process control results in a constant removal rate.

Although the teaching of controlling the physical quantity such that the target polishing speed becomes constant appears to be inherent in the invention of Yueh as explained above, it is not explicitly stated.

However, it would have been obvious to one of ordinary skill in the art at the time of invention to control the physical quantity such that the target polishing speed becomes constant, in order to provide a predictable end-point for the polishing. This advantage is notoriously old and well known in the art of CMP as taught by Yu (Col. 2, Lines 3-4).

**Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,117,779 to Shelton et al.**

Referring to figures 2, and 3, Shelton teaches a method of chemical mechanical polishing (CMP) comprising: supplying a slurry (268), and polishing an object (100) with particles contained in the slurry,

Art Unit: 1763

including controlling a physical quantity which is a determinant factor of a polishing speed with respect to the object, based on information on the particles contained in the slurry. *Note: the information on the particles contained in the slurry is received by controller (280) from sensor (276). The controller (280) adjusts pressure on the polishing pad (282), pad speed (283), plate speed (284), slurry flow (287) etc.*

Shelton also teaches a step of controlling polishing time based on information on the particles contained in the slurry as recited in claim 3. (Col. 11, Lines 3-5)

As recited in claim 2, Shelton also teaches setting a target polishing speed according the type or quality of the surface film of the object to be polished. Although Shelton does not state explicitly that the target speed is set, the controller must inherently have a set point in order to control the process within tolerances, as one of ordinary skill in the art of process control recognizes.

#### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,177,779 to Shelton in view of U.S. Patent 5,531,861 to Yu et al.**

As recited above, Shelton teaches the method of the invention substantially as claimed, but does not teach controlling the physical quantity such that the target polishing speed becomes constant.

It would have been obvious to one of ordinary skill in the art at the time of invention to control the physical quantity such that the target polishing speed becomes constant, in order to provide a predictable end-point for the polishing. This advantage is notoriously old and well known in the art of CMP as taught by Yu (Col. 2, Lines 3-4).

Although Shelton does not state explicitly that the target speed is set, and it is believed to be an inherent feature as explained above, it would have been obvious to one of ordinary skill in the art at the

Art Unit: 1763

time of invention to use a set point to control the process within acceptable tolerances in the conventional manner. Official Notice is taken that it is conventional in the art to determine the approximate rate of removal of a wafer in a CMP process by experimentally determining the rate of removal of a test wafer.

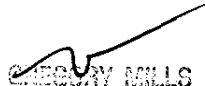
**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (703) 305-7965. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

R. Culbert



GREGORY MILLS  
SUPERVISOR PATENT EXAMINER  
TECHNOLOGY CENTER 1700